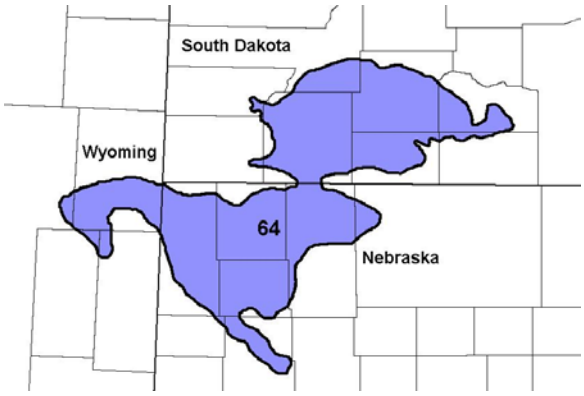
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Subirrigated

Site ID: R064XY024NE

Major Land Resource Area: 64 – Mixed Sandy and Silty Tableland

Physiographic Features

This site occurs on nearly level bottomlands and alluvial fans adjacent to streams, springs and ponds.

Landform: alluvial fans, stream terraces **Aspect:** N/A

	Minimum	Maximum
Elevation (feet):	2900	4000
Slope (percent):	0	3
Water Table Depth (inches):	18	36
Flooding:		
Frequency:	Occasional	Frequent
Duration:	Brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Medium

Climatic Features

MLRA 64 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the northern Great Plains and the winds move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 20 inches per year. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 21° F (Wood, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool season plants begins mid to late March and continues to late June. Native warm season plants begin growth in early May and continue to late August. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	Minimum	Maximum
Frost-free period (days):	115	143
Freeze-free period (days):	137	163
Mean Annual Precipitation (inches):	14	20

Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.42	0.52	9.0	35.8
February	0.48	0.61	14.6	40.7
March	0.90	1.22	21.0	47.5
April	1.83	2.15	28.9	61.3
May	2.22	3.38	38.3	72.2
June	2.05	3.27	47.3	82.1
July	1.63	2.73	53.9	90.1
August	1.09	1.96	52.3	89.3
September	1.09	1.58	42.4	79.5
October	0.80	1.38	32.6	66.6
November	0.56	0.65	20.4	49.0
December	0.42	0.50	13.4	38.4

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
NE3755	Hemingford, NE	1964	1999
WY5085	Keeline 3 W, WY	1953	1986
SD9442	Wood, SD	1948	1999

For local climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

This ecological site has a combination of physical and hydrological features that: 1) provide season-long ground water within 3.5 feet of the surface, 2) allows relatively free movement of water and air in the upper part of the soil, and 3) are rarely, or occasionally flooded.

Wetland Description:	**System**	**Subsystem**	**Class**	**Sub-class**
Cowardin, et al., 1979	Palustrine	N/A	Emergent Wetland	Persistent

Representative Soil Features

The features common to all soils in this site are the silty clay loam to loamy fine sand textured surface soils and slopes of 0 to 3 percent. These soils have water tables below the surface for all of the growing season. The water table is non-saline and non-alkaline. The soils in this site are somewhat poorly drained and formed in loamy or sandy alluvium. The surface layer is 4 to 15 inches thick. The texture of the subsurface soils ranges from silty clay loam to sand. This site should show no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are typically indistinguishable. The soil surface is stable and intact. Sub-surface soil layers are not restrictive to water movement and root penetration.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium
Parent Material Origin: mixed
Surface Texture: silt loam, very fine sandy loam, fine sandy loam
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0-6
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	somewhat poorly	somewhat poorly
Permeability Class:	moderately slow	moderately rapid
Depth (inches):	>80	>80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	5.6	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	3	8
Calcium Carbonate Equivalent (percent)*:	0	15

* These attributes represent 0-40 inches in depth or to the first restrictive layer.

Plant Communities

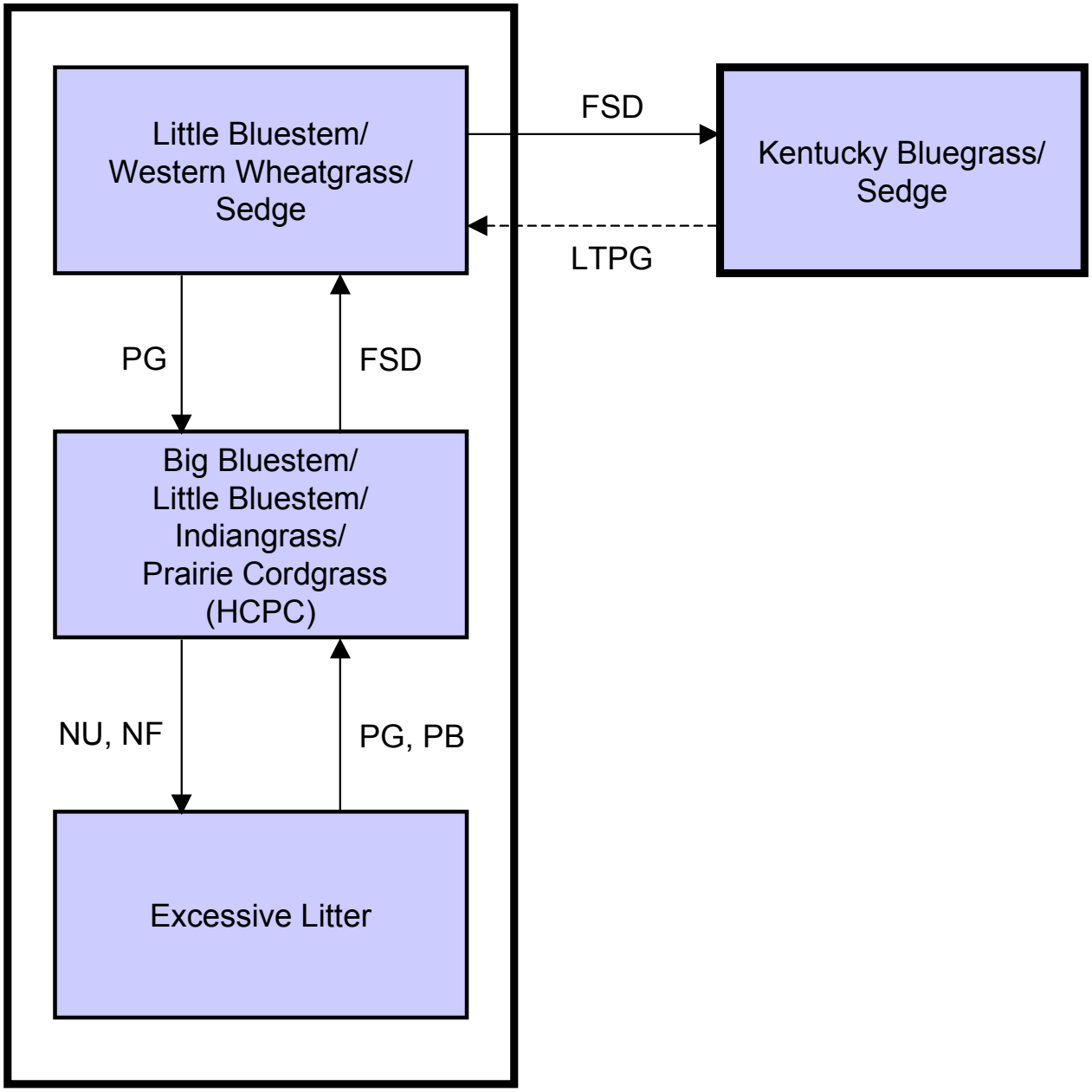
Ecological Dynamics of the Site
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Under continued adverse impacts, a decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can return to the Historic Climax Plant Community (HCPC).

As this site deteriorates from a combination of frequent and severe grazing, species such as Kentucky bluegrass, Baltic rush, scouring rush and other various grass-likes will increase forming a cool season dominated plant community. Grasses such as big bluestem, prairie cordgrass, Indiangrass, and switchgrass will decrease in frequency and production and can eventually be removed from the site. Little bluestem and western wheatgrass will initially increase and then begin to decrease. Kentucky bluegrass and sedges will continue to increase and eventually become sod-bound. Plants such as Dalmatian toadflax, kochia, and leafy spurge will invade the site. Excessive litter, decadence and plant mortality can result from the lack of fire or non-use.

The plant community upon which interpretations are primarily based is the HCPC. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



FSD - frequent severe defoliation; **HCPC -** Historic Climax Plant Community;
LTPG - long-term prescribed grazing (>20 years); **NF, NU -** no fire, non-use;
PB - prescribed burn; **PG -** prescribed grazing with adequate recovery opportunity.

Plant Community Composition and Group Annual Production

			Big Bluestem/Little Bluestem/Indiangrass/ Prairie Cordgrass (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES				*3225 - 3655*	*75 - 85*
WARM SEASON MID-TALL GRASS			**1**	**1505 - 3225**	**35 - 75**
big bluestem	Andropogon gerardii	ANGE	1	645 - 1075	15 - 25
Indiangrass	Sorghastrum nutans	SONU2	1	430 - 645	10 - 15
little bluestem	Schizachyrium scoparium	SCSC	1	430 - 645	10 - 15
prairie cordgrass	Spartina pectinata	SPPE	1	430 - 645	10 - 15
switchgrass	Panicum virgatum	PAVI2	1	215 - 645	5 - 15
COOL SEASON MID-GRASS			**2**	**215 - 430**	**5 - 10**
slender wheatgrass	Elymus trachycaulus ssp. trachycaulus	ELTRT	2	0 - 430	0 - 10
western wheatgrass	Pascopyrum smithii	PASM	2	0 - 430	0 - 10
Canada wildrye	Elymus canadensis	ELCA4	2	0 - 215	0 - 5
SEDGES AND RUSHES			**3**	**215 - 430**	**5 - 10**
sedge	Carex spp.	CAREX	3	215 - 430	5 - 10
Baltic rush	Juncus balticus	JUBA	3	0 - 86	0 - 2
bulrush	Schoenoplectus spp.	SCHOE6	3	0 - 86	0 - 2
horsetail	Equisetum laevigatum	EQLA	3	0 - 86	0 - 2
rush	Juncus spp.	JUNCU	3	0 - 86	0 - 2
spikerush	Eleocharis spp.	ELEOC	3	0 - 86	0 - 2
MISCELLANEOUS GRASSES			**4**	**0 - 215**	**0 - 5**
alkali sacaton	Sporobolus airoides	SPAI	4	0 - 215	0 - 5
foxtail barley	Hordeum jubatum	HOJU	4	0 - 215	0 - 5
green muhly	Muhlenbergia racemosa	MURA	4	0 - 215	0 - 5
other perennial grasses		2GP	4	0 - 215	0 - 5
FORBS			*5*	*215 - 430*	*5 - 10*
American licorice	Glycyrrhiza lepidota	GLLE3	5	0 - 86	0 - 2
arrowgrass	Triglochin palustre	TRPA6	5	0 - 86	0 - 2
clover	Trifolium spp.	TRIFO	5	0 - 86	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	5	0 - 86	0 - 2
false boneset	Brickellia eupatorioides	BREU	5	0 - 86	0 - 2
goldenrod	Solidago spp.	SOLID	5	0 - 86	0 - 2
heath aster	Symphyotrichum ericoides	SYER	5	0 - 86	0 - 2
Maximilian sunflower	Helianthus maximiliani	HEMA2	5	0 - 86	0 - 2
milkvetch	Astragalus spp.	ASTRA	5	0 - 86	0 - 2
shootingstar	Dodecatheon spp.	DODEC	5	0 - 86	0 - 2
smartweed	Polygonum spp.	POLYG4	5	0 - 86	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	5	0 - 86	0 - 2
other perennial forbs		2FP	5	0 - 86	0 - 2
SHRUBS			*6*	*0 - 215*	*0 - 5*
rose	Rosa spp.	ROSA5	6	0 - 215	0 - 5
silver buffaloberry	Shepherdia argentea	SHAR	6	0 - 215	0 - 5
western snowberry	Symphoricarpos occidentalis	SYOC	6	0 - 215	0 - 5
other shrubs		2SHRUB	6	0 - 215	0 - 5
TREES			*7*	*0 - 215*	*0 - 5*
willow	Salix spp.	SALIX	7	0 - 215	0 - 5

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	3290 -	3769	-4110
FORBS	210 -	319	-450
SHRUBS	0 -	106	-220
TREES	0 -	106	-220
TOTAL	3500 -	4300	-5000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative Value.

Plant Community Composition and Group Annual Production

		Big Bluestem/Little Bluestem/ Indiangrass/Prairie Cordgrass			Little Bluestem/Western Wheatgrass/Sedge			Excessive Litter			Kentucky Bluegrass/Sedge		
COMMON/GROUP NAME	**SYMBOL**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**
GRASSES			*2580 - 3655*	*60 - 85*		*1800 - 2250*	*60 - 75*		*2160 - 2700*	*60 - 75*		*960 - 1200*	*60 - 75*
WARM SEASON MID-TALL GRASS		**1**	**2150 - 3225**	**50 - 75**	**1**	**600 - 1350**	**20 - 45**	**1**	**180 - 360**	**5 - 10**	**1**	**32 - 160**	**2 - 10**
big bluestem	ANGE	1	645 - 1075	15 - 25	1	150 - 300	5 - 10	1	180 - 360	5 - 10	1	0 - 32	0 - 2
little bluestem	SCSC	1	430 - 645	10 - 15	1	150 - 600	5 - 20	1	180 - 540	5 - 15	1	32 - 160	2 - 10
prairie cordgrass	SPPE	1	430 - 645	10 - 15	1	150 - 300	5 - 10	1	180 - 360	5 - 10	1	0 - 80	0 - 5
Indiangrass	SONU2	1	430 - 645	10 - 15	1	0 - 150	0 - 5	1	180 - 360	5 - 10	1	0 - 32	0 - 2
switchgrass	PAVI2	1	215 - 645	5 - 15	1	150 - 300	5 - 10	1	180 - 360	5 - 10	1	0 - 80	0 - 5
COOL SEASON MID-GRASS		**2**	**0 - 430**	**0 - 10**	**2**	**150 - 450**	**5 - 15**	**2**	**0 - 360**	**0 - 10**	**2**	**0 - 160**	**0 - 10**
western wheatgrass	PASM	2	0 - 430	0 - 10	2	150 - 450	5 - 15	2	0 - 360	0 - 10	2	0 - 160	0 - 10
slender wheatgrass	ELTRT	2	0 - 430	0 - 10	2	0 - 60	0 - 2	2	0 - 180	0 - 5	2	0 - 16	0 - 1
Canada wildrye	ELCA4	2	0 - 215	0 - 5	2	0 - 150	0 - 5	2	0 - 180	0 - 5	2	0 - 16	0 - 1
SEDGES AND RUSHES		**3**	**215 - 430**	**5 - 10**	**3**	**150 - 600**	**5 - 20**	**3**	**180 - 720**	**5 - 20**	**3**	**160 - 480**	**10 - 30**
sedge	CAREX	3	215 - 430	5 - 10	3	150 - 600	5 - 20	3	180 - 720	5 - 20	3	160 - 480	10 - 30
Baltic rush	JUBA	3	0 - 86	0 - 2	3	0 - 60	0 - 2	3	0 - 72	0 - 2	3	0 - 80	0 - 5
bulrush	SCHOE6	3	0 - 86	0 - 2	3	0 - 60	0 - 2	3	0 - 72	0 - 2	3	0 - 32	0 - 2
horsetail	EQLA	3	0 - 86	0 - 2	3	0 - 60	0 - 2	3	0 - 72	0 - 2	3	0 - 32	0 - 2
rush	JUNCU	3	0 - 86	0 - 2	3	0 - 60	0 - 2	3	0 - 72	0 - 2	3	0 - 80	0 - 5
spikerush	ELEOC	3	0 - 86	0 - 2	3	0 - 60	0 - 2	3	0 - 180	0 - 5	3	80 - 160	5 - 10
MISCELLANEOUS GRASSES		**4**	**0 - 215**	**0 - 5**	**4**	**150 - 450**	**5 - 15**	**4**	**180 - 540**	**5 - 15**	**4**	**320 - 640**	**20 - 40**
alkali sacaton	SPAI	4	0 - 215	0 - 5	4	0 - 60	0 - 2	4	0 - 72	0 - 2	4	0 - 16	0 - 1
foxtail barley	HOJU	4	0 - 215	0 - 5	4	0 - 150	0 - 5	4	0 - 180	0 - 5	4	80 - 160	5 - 10
green muhly	MURA	4	0 - 215	0 - 5	4	0 - 150	0 - 5	4	0 - 180	0 - 5	4	0 - 80	0 - 5
Kentucky bluegrass	POPR	4			4	150 - 450	5 - 15	4	180 - 540	5 - 15	4	240 - 640	15 - 40
other perennial grasses	2GP	4	0 - 215	0 - 5	4	0 - 150	0 - 5	4	0 - 180	0 - 5	4	0 - 80	0 - 5
FORBS		*5*	*215 - 430*	*5 - 10*	*5*	*150 - 300*	*5 - 10*	*5*	*180 - 360*	*5 - 10*	*5*	*80 - 240*	*5 - 15*
American licorice	GLLE3	5	0 - 86	0 - 2	5	30 - 150	1 - 5	5	36 - 180	1 - 5	5	16 - 80	1 - 5
arrowgrass	TRPA6	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 32	0 - 2
clover	TRIFO	5	0 - 86	0 - 2	5	0 - 150	0 - 5	5	0 - 72	0 - 2	5	0 - 32	0 - 2
cudweed sagewort	ARLU	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 80	0 - 5
false boneset	BREU	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 32	0 - 2
heath aster	SYER	5	0 - 86	0 - 2	5	0 - 150	0 - 5	5	0 - 180	0 - 5	5	0 - 80	0 - 5
Maximilian sunflower	HEMA2	5	0 - 86	0 - 2	5	0 - 30	0 - 1	5	0 - 36	0 - 1	5	0 - 16	0 - 1
milkvetch	ASTRA	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 16	0 - 1
smartweed	POLYG4	5	0 - 86	0 - 2	5	0 - 150	0 - 5	5	0 - 180	0 - 5	5	0 - 80	0 - 5
western ragweed	AMPS	5	0 - 86	0 - 2	5	0 - 150	0 - 5	5	0 - 180	0 - 5	5	16 - 160	1 - 10
goldenrod	SOLID	5	0 - 86	0 - 2	5	0 - 150	0 - 5	5	0 - 180	0 - 5	5	0 - 80	0 - 5
shootingstar	DODEC	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 16	0 - 1
other perennial forbs	2FP	5	0 - 86	0 - 2	5	0 - 60	0 - 2	5	0 - 72	0 - 2	5	0 - 32	0 - 2
SHRUBS		*6*	*0 - 215*	*0 - 5*	*6*	*0 - 150*	*0 - 5*	*6*	*0 - 180*	*0 - 5*	*6*	*0 - 80*	*0 - 5*
rose	ROSA5	6	0 - 215	0 - 5	6	0 - 150	0 - 5	6	0 - 180	0 - 5	6	0 - 80	0 - 5
silver buffaloberry	SHAR	6	0 - 215	0 - 5	6	0 - 150	0 - 5	6	0 - 180	0 - 5	6	0 - 80	0 - 5
western snowberry	SYOC	6	0 - 215	0 - 5	6	0 - 150	0 - 5	6	0 - 180	0 - 5	5	0 - 80	0 - 5
other shrubs	2SHRUB	6	0 - 215	0 - 5	6	0 - 90	0 - 3	6	0 - 108	0 - 3	6	0 - 16	0 - 1
TREES		*7*	*0 - 215*	*0 - 5*	*7*	*0 - 150*	*0 - 5*	*7*	*0 - 360*	*0 - 10*	*7*	*0 - 32*	*0 - 2*
willow	SALIX	7	0 - 215	0 - 5	7	0 - 150	0 - 5	7	0 - 360	0 - 10	7	0 - 32	0 - 2

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	3290 - 3763 - 4110	2255 - 2625 - 2965	2825 - 3060 - 3265	1125 - 1384 - 2030
FORBS	210 - 323 - 450	145 - 225 - 325	175 - 270 - 375	75 - 160 - 250
SHRUBS	0 - 108 - 220	0 - 75 - 155	0 - 90 - 185	0 - 40 - 85
TREES	0 - 108 - 220	0 - 75 - 155	0 - 180 - 375	0 - 16 - 35
TOTAL	3500 - 4300 - 5000	2400 - 3000 - 3600	3000 - 3600 - 4200	1200 - 1600 - 2400

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Big Bluestem/Little Bluestem/Indiangrass/Prairie Cordgrass Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. Historically, fires occurred infrequently. The potential vegetation is about 80-95% grasses and grass-likes, 5-10% forbs, and 0-10% woody plants by air-dry weight.

Tall and mid warm season grasses dominate this community. The major grasses include big bluestem, little bluestem, prairie cordgrass, Indiangrass and switchgrass. Other grasses and grass-likes occurring on the community include western wheatgrass, Canada wildrye, Baltic rush, spikerushes, and bulrushes. Key forbs and shrubs include American licorice, Maximilian sunflower, clovers, milkvetches and willows.

This plant community is diverse, stable, productive and well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. Plant litter is properly distributed with little movement and natural plant mortality is very low. This is a sustainable plant community in terms of soil stability, watershed function and biologic integrity.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: NE6410
Growth curve name: Pine Ridge/Badlands, lowland warm-season dominant.
Growth curve description: Warm-season dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	15	25	25	17	6	2	0	0

Transitions or pathways leading to other plant communities are as follows:

- Frequent and severe defoliation will shift this plant community *Little Bluestem/Western Wheatgrass/Sedge Plant Community*.
- Non-use and no fire will convert the HCPC to the *Excessive Litter Plant Community*. Initially, excess litter begins to build-up. Eventually native plants can show signs of mortality and decadence.

Little Bluestem/Western Wheatgrass/Sedge Plant Community

This plant community developed under frequent and severe defoliation without periodic rest. Big bluestem, prairie cordgrass, Indiangrass, switchgrass, and Canada wildrye have been significantly reduced. Little bluestem may initially increase or decrease depending upon the season of use. Kentucky bluegrass has begun to invade. This plant community is at risk of losing tall warm season grasses, palatable forbs and shrubs.

This community indicates key management concerns. Prescribed grazing at this point will stabilize the community at or near the HCPC, while increased disturbance can easily move the community to a more degraded state.

While plant diversity has been reduced, the soil is stable. The water cycle, nutrient cycle and energy flow is slightly reduced but continues to adequately function.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: NE6408
Growth curve name: Pine Ridge/Badlands, lowland cool-season/warm-season co-dominant.
Growth curve description: Cool-season, warm-season co-dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	12	20	25	19	11	5	3	0	0

Transitions or pathways leading to other plant communities are as follows:

- Frequent and severe defoliation shifts this plant community to the *Kentucky Bluegrass/Sedge Plant Community*.
- Prescribed grazing with adequate recovery opportunity between grazing events will restore this community back to the *Big Bluestem/Little Bluestem/Indiangrass/Prairie Cordgrass Plant Community (HCPC)*.

Excessive Litter Plant Community

This plant community occurs after an extended period of non-use, and where fire has been eliminated. The dominant plants tend to be similar to those found in the Historic Climax Plant Community, however in advanced stages, frequency and production can be lower.

Litter amounts have increased causing plants to become decadent. Much of the plant nutrients are tied up in excessive litter. Organic matter oxidizes in the air rather than being incorporated into the soil due to the absence of animal impact. Typically, bunchgrasses (little bluestem) develop dead centers and rhizomatous grasses (prairie cordgrass) form small colonies because of a lack of tiller stimulation.

This plant community is not resistant to change. Grazing or fire can easily move it toward the HCPC. Soil erosion is not a concern due to increased litter levels and landscape position.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: NE6409
Growth curve name: Pine Ridge/Badlands, warm-season dominant, cool-season sub-dominant.
Growth curve description: Warm-season dominant, cool-season sub-dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	8	18	27	23	12	6	3	0	0

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing, or prescribed burning followed by prescribed grazing will shift this plant community towards the *Big Bluestem/Little Bluestem/Indiangrass/Prairie Cordgrass Plant Community (HCPC)*.

Kentucky Bluegrass/Sedge Plant Community

This plant community developed with further frequent and severe defoliation. The plant community is predominantly cool season grasses and grass-likes. Kentucky bluegrass has fully invaded the community and persists in a sod-bound condition. Baltic rush, various sedges, and foxtail barley have increased. Remnant amounts of western wheatgrass may still persist in localized colonies. Big bluestem, little bluestem, prairie cordgrass, Indiangrass, and switchgrass have been removed. Forbs such as kochia and Russian thistle have also increased. Invasive species such as leafy spurge and downy brome can invade the site if prescribed grazing management is not implemented.

This community remains stable but has lost much of its production and diversity. The nutrient cycle is impaired due to the loss of warm season grass species, deep-rooted forbs (legumes and others) and shrubs. Soil compaction can be a concern if continuously grazed during wet cycles. It will take a long time to bring this plant community back to the HCPC with management alone. Renovation would be very costly due to high salt/alkali content and water table.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: NE6407
Growth curve name: Pine Ridge/Badlands, cool-season dominant, warm-season sub-dominant.
Growth curve description: Cool-season dominant, warm-season sub-dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	8	25	30	15	10	2	5	0	0

Transitions or pathways leading to other plant communities are as follows:

- Long-term prescribed grazing will move this plant community to the *Little Bluestem/Western Wheatgrass/Sedge Plant Community* and will eventually return to the *HCPC* or associated successional plant stages assuming an adequate seed/vegetative source is available. This process may require a long period of time to accomplish and may be difficult to attain depending on the degree of degradation.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Big Bluestem/Little Bluestem/Indiangrass/Prairie Cordgrass Plant Community:

Little Bluestem/Western Wheatgrass/Sedge Plant Community:

Excessive Litter Plant Community:

Kentucky Bluegrass/Sedge Plant Community:

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-likes							
alkali sacaton	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D U
Baltic rush	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
bulrush	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
foxtail barley	U D N N	N P N N	U D N N	N P N N	N P N N	U D N N	U D N N
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D U
horsetail	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
prairie cordgrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D U
rush	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
spikerush	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
arrowgrass	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
milkvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
Shrubs							
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	U U U U	D U U U	D U U U
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
Trees							
willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic
† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity* (AUM/acre)
Big Bluestem/Little Bluestem/Indiangrass/Prairie Cordgrass	4300	1.34
Little Bluestem/Western Wheatgrass/Sedge	3000	0.95
Excessive Litter	3600	1.16
Kentucky Bluegrass/Sedge	1600	0.51

* Continuous, season-long grazing by cattle under average growing conditions.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Moisture conditions are ideal for forage production on this site. Soils on this site are mostly in Hydrologic Soil Group C, but may include soils in Group D, and local areas in Group A. Although most of these soils are very permeable, water tables provide subirrigation of grasses and other vegetation. Surrounding upland areas tend to also have permeable soils and surface inflow peaks on these sites are often muted. These sites are rarely to occasionally flooded. Refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves.

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(064XY022NE) – Wetland
(064XY029NE) – Sandy Lowland

Similar Sites

(064XY025NE) – Saline Subirrigated
[more salt tolerant species]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Jill Epley, Range Management Specialist, NRCS; Rick Peterson; Range Management Specialist, NRCS; David Steffen, Range Management Specialist, NRCS; Jeff Vander Wilt; Range Management Specialist, NRCS.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417				
Ocular estimates				

State Correlation

This site has been correlated with Nebraska, South Dakota and Wyoming in MLRA 64.

Field Offices/Counties

Alliance, NE	Box Butte	Lusk, WY	Niobrara	Torrington, WY	Goshen
Bridgeport, NE	Morrill	Martin, SD	Bennett/Shannon	Wall, SD	East Pennington
Chadron, NE	Dawes/Sioux	Rapid City, SD	Pennington	Wheatland, WY	Platte
Douglas, WY	Converse	Rushville, NE	Sheridan		
Kadoka, SD	Jackson	Scottsbluff, NE	Scottsbluff		

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

State Range Management Specialist	Date	State Range Management Specialist	Date
State Range Management Specialist	Date		